

NON-PUBLIC?: N
ACCESSION #: 9507070189
LICENSEE EVENT REPORT (LER)

FACILITY NAME: James A. FitzPatrick Nuclear Power Plant PAGE: 1 OF 7

DOCKET NUMBER: 05000333

TITLE: Technical Specification Required Plant Shutdown Due to
Unidentified Leakage Into Drywell
EVENT DATE: 05/30/95 LER #: 95-010-00 REPORT DATE: 06/28/95

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 16

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(i)

LICENSEE CONTACT FOR THIS LER:
NAME: Mr. Gordon Brownell, Senior TELEPHONE: (315) 349-6360
Licensing Engineer

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: AD COMPONENT: ISV MANUFACTURER: V080
REPORTABLE NPRDS: N

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 05/29/95 at 2216 hours, with the plant operating at 100 percent rated power, operators at the James A. FitzPatrick Nuclear Power Plant (JAFNPP) observed Drywell Floor Sump level recorder readings indicating an increase in the Drywell floor drain leakage rate. The reactor coolant leakage rate slowly increased and at 0538 hours, with the leakage rate at 1.37 gallons per minute (gpm), the decision was made to commence a normal plant shutdown to identify the source of the leakage. At 1200 hours, with the plant operating at approximately 16 percent power, Primary Containment reactor coolant leakage rate had reached and exceeded Technical Specification (T.S.) limit of 2gpm increase within any 24 hour period and an Unusual Event was declared. At 1235 hours, operators inserted a manual reactor scram to expedite reactor cooldown and depressurization.

The cause was identified as a packing leak on a 3/4 inch Reactor Water

Recirculation System (RWR) valve located on piping connecting the "B" Recirculation pump suction line to the Jet Pump Instrument drain line. The plant was brought to cold shutdown condition, entry was made into the primary containment, and corrective maintenance was completed on the RWR valve.

END OF ABSTRACT

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Event Description

On May 29, 1995 at 2216 hours, with the plant operating at 100 percent rated power, operators at the James A. FitzPatrick Nuclear Power Plant (JAFNPP) observed Primary Containment Drywell Floor Sump level recorder readings indicating an increase in the Drywell floor drain leakage rate. Drywell floor leakage rate baseline value had been established at 0.05 gallons per minute (gpm). At 0538 hours, reactor coolant leakage rate had slowly increased to 1.37gpm and the decision was made to commence a normal plant shutdown to identify the source of the leakage. At 0705 hours, with reactor coolant leakage rate stabilized at approximately 1.45gpm, operations commenced a plant shutdown. However, at 1105 hours, the leakage rate began increasing, and at 1200 hours, with the plant operating at approximately 16 percent power, the reactor coolant leakage rate had reached and exceeded the Technical Specification (T.S.) section 3.6.D.1.b limit of 2gpm increase in unidentified leakage within any 24 hour period and an Unusual Event was declared. At 1235 hours, operators inserted a manual reactor scram to expedite T.S. section 3.6.D.3 shutdown requirements.

The sequence of events leading up to and immediately following the manual scram is presented below:

May 29, 1995

2216 hours - Control Room operators identified an upward trend on both Drywell Equipment & Floor Sumps Level Recorders 20LR-122A and 20LR-122B.

May 30, 1995

0016 hours - Drywell floor leakage rate calculations increased from 0.08gpm to 0.46gpm.

0050 hours - Containment Radiation Monitoring equipment for particulate, gaseous and iodine activity showed

increased readings. Control Room operators reviewed Abnormal Operating Procedure AOP-39, "Loss of Coolant". Condition notification made by Control Room to Operations Manager.

0109 hours - Chemistry Department was directed to obtain Drywell Floor Sump samples as a possible aid in identifying source of leakage. Plant Resident Manager and General Manager of operations were informed of the developing conditions.

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0400 hours - Operators continued to monitor leakage rates and performed evaluations to determine possible source of Drywell leakage.

0405 hours - Drywell Floor Drain leakage calculation was 1.17gpm.

0420 hours - During NRC plant status/phone check, operators informed the NRC Operations Center of the increasing Drywell Floor leakage condition and JAFNPP's close monitoring of the situation.

0420 hours - Radiation Protection Department completed an isotopic analysis of a Drywell Floor Drain grab sample and reported that a significant amount of iodine was present indicating reactor coolant leakage rather than steam leakage or leakage from Reactor Building Closed Loop Cooling or Feedwater Systems.

0522 hours - Drywell Floor Drain leakage calculation was 1.375gpm.

0538 hours - Decision was made to commence a normal plant shutdown.

0610 hours - Drywell Floor Drain leakage calculation was 1.333gpm.

0700 hours - Drywell Floor Drain leakage calculation was 1.45gpm.

0705 hours - Plant commenced a normal plant shutdown.

0800 hours - Drywell Floor leakage calculation was 1.33gpm.

0908 hours - Drywell Floor leakage calculation was 1.47gpm.

0916 hours - Reactor power lowered to 40 percent.

1012 hours - Drywell Floor Leakage calculation was 1.41 gpm.

1044 hours - Reactor power reduced to 18.1 percent.

1105 hours - Drywell Floor leakage calculation was 1.51 gpm.

1200 hours - Drywell Floor leakage calculation was 2.91 gpm. Plant declared entry into an Unusual Event based on unidentified Drywell leakage increase greater than 2 gallons per minute in a 24 hour period. Control Room enters Limiting Condition For Operation (LCO) A95-0493 required by T.S. Section 3.6.D "Coolant Leakage".

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1213 hours - Control Room operators entered AOP-39, "Loss of Coolant".

1222 hours - 10CFR50.72 notification made to the NRC of T.S. required plant shutdown and plant entry into an Unusual Event.

1229 hours - Main Generator removed from service. Main Turbine manually tripped.

1235 hours - Manual reactor scram was inserted to expedite reactor cooldown and depressurization.

1304 hours - Drywell Floor leakage was 2.66 gpm.

1305 hours - Commenced reactor pressure vessel (RPV) cooldown.

May 31, 1995

0247 hours - Reactor in the Cold Condition, reactor coolant temperature less than 212 degrees Fahrenheit. Exited LCO A95-0493 for reactor coolant leakage into Primary Containment.

0250 hours - Plant terminated from Unusual Event.

0303 hours - NRC notified that Unusual Event at JAFNPP had been terminated.

Upon entry into the Drywell, the location and cause for the unidentified reactor coolant leakage was determined to be a packing leak on a manual 3/4 inch Reactor Water Recirculation System valve 02-2RWR-52B.

Valve 02-2RWR-52B is located between the "B" Recirculation pump suction line and the Jet Pump Instrument Nozzle drain line. The line provides minimal reactor coolant flow through the Jet Pump delta pressure instrument nozzles improving water chemistry in the nozzle areas.

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Cause of the Event

A review of maintenance activities associated with the identified leaking valve was conducted to provide a possible cause for the failed packing. Maintenance data indicated that the valve had been installed in 1990 and was equipped with the original braided style packing. This type of packing is known to rapidly deteriorate after initial leakage develops. Inspection of the valve showed that the packing was intact, but did have a flow stream through it which allowed the observed leakage at high pressure. Additionally, the normally open positioned globe valve had not been backseated, which, when completed, reduces pressure loads on the valve packing during system operation.

Analysis of the Event

This event is reportable in accordance with 10CFR50.73(a)(2)(i)(A), which requires Licensees to report "The Completion of any nuclear plant shutdown required by the plant's Technical Specification".

Technical Specification 3.6.D, REACTOR COOLANT SYSTEM, Coolant Leakage, requires that "Anytime irradiated fuel is in the reactor vessel and the reactor coolant temperature is above 212 degrees Fahrenheit, the reactor coolant leakage into the Primary Containment shall be limited to: 2gpm increase in unidentified leakage within any 24 hour period". Additionally, when leakage equals or is greater than the limits specified, the source of the leakage shall be identified within 4 hours or the reactor shall be in at least hot standby condition within the following 12 hours and in Cold Condition within the following 24 hours.

Drywell Floor leakage baseline value had been established at 0.05gpm. The maximum calculated reactor coolant leakage recorded during the event was 2.91gpm on 05/30/95 at 1200 hours. Leakage rate value for the past 24 hour period had increased by 2.86gpm.

During the event evolution, prudent and conservative decisions were made to commence a plant shutdown prior to entering T.S. required action statements. The plant safely reached the Cold Condition within 14 hours and 47 minutes of entering the LCO condition to support investigation and corrective action. The Reactor Coolant Leak Detection System and the Continuous Atmosphere Monitoring System functioned as designed.

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Corrective Actions

1. Valve 02-2RWR-52B was repacked using the current maintenance practice of repacking with non-asbestos graphite. This provides improved resistance to rapid degradation during leakage, and it has superior performance in limiting loss of pre-load over packing life. The corresponding "A" loop Reactor Water Recirculation loop valve, 02-2RWR-52A, was repacked during the 1994-1995 refuel outage.
2. Based on reviews of valve design and thermal expansion characteristics, both valves (02-2RWR-52A and 52B) were backseated to provide an additional barrier to prevent packing leakage. Additionally, other normally opened small bore manual valves in the Drywell have been evaluated and backseated where appropriate.
3. All leakage identified from valve packing during the 1995 refuel outage vessel hydro was evaluated and/or repaired prior to plant start-up. A similar course of action was taken during this plant start-up 1000 psig inspection.

Additional information

Failed Component:

Component Identification: 02-2RWR-52B

Component Description: 3/4 inch Stainless Steel Socket Welded Manual Globe Valve

Model: W4-376-13MS

Rating: 1500 psig

Manufacturer: Velan Engineering Companies

Design Code: ANSI B31.1.0

Previous Similar Events:

None

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System and Component Identification:

SYSTEM - COMPONENT IEEE 803A EHS

Reactor Water Recirculation System N/A AD
Containment Radiation Monitoring System N/A IK
Equipment and Floor Drain System N/A WK
Reactor Building Closed Loop Cooling System N/A CC
Feedwater System N/A SJ
Level Recorders LR N/A
Main Turbine TRB N/A
Reactor Pressure Vessel RPV N/A
Isolation Valve ISV N/A
Jet Pump P N/A

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